

What Is Claimed Is:

1        1. A method for selectively auditing accesses to a relational database,  
2 comprising:

3            receiving a query for the relational database;  
4            modifying the query so that processing the query causes an audit record to  
5 be created and recorded for rows in relational tables that are accessed by the query  
6 and that satisfy an auditing condition;

7            processing the modified query to produce a query result, wherein  
8 processing the modified query includes,

9                  creating the audit record for rows in relational tables that  
10 are accessed by the query and that satisfy the auditing condition,  
11 and

12                  recording the audit record in an audit record store; and  
13 returning the query result.

1        2. The method of claim 1, further comprising, if the query includes a  
2 select statement, inserting a case statement into the select statement that calls a  
3 function that causes the audit record to be created and recorded if the auditing  
4 condition is satisfied.

1        3. The method of claim 2, further comprising ensuring that the case  
2 statement is evaluated near the end of the query processing so that the case  
3 statement is evaluated only after other conditions of the query are satisfied, so that  
4 the audit record is created only for rows that are actually accessed by the query.

1           4. The method of claim 1, further comprising retrieving the auditing  
2 condition for a given table from a data structure associated with the given table.

1           5. The method of claim 1, wherein if the query modifies at least one  
2 entry in the relational database, using a relational database system trigger to create  
3 and record the audit record for the modification to the relational database.

1           6. The method of claim 2, wherein inserting the case statement into  
2 the query further comprises:

3           inserting the case statement into the query;  
4           allowing a query processor to allocate buffers for the query;  
5           removing the case statement from the query;  
6           allowing the query processor to generate a query plan for the query; and  
7           scheduling the case statement near the end of the query plan to ensure that  
8           the case statement is evaluated only after other conditions of the query are  
9           satisfied, so that the audit record is created only for rows that are actually accessed  
10          by the query.

1           7. The method of claim 1, wherein the audit record includes:  
2           a user name for a user making the query;  
3           a time stamp specifying a time of the query; and  
4           a text of the query.

1           8. The method of claim 1, wherein the auditing condition includes a  
2 condition for a field within the relational database.

1           9. A computer-readable storage medium storing instructions that  
2 when executed by a computer cause the computer to perform a method for  
3 selectively auditing accesses to a relational database, the method comprising:  
4           receiving a query for the relational database;  
5           modifying the query so that processing the query causes an audit record to  
6 be created and recorded for rows in relational tables that are accessed by the query  
7 and that satisfy an auditing condition;  
8           processing the modified query to produce a query result, wherein  
9 processing the modified query includes,  
10           creating the audit record for rows in relational tables that  
11 are accessed by the query and that satisfy the auditing condition,  
12 and  
13           recording the audit record in an audit record store; and  
14 returning the query result.

1           10. The computer-readable storage medium of claim 9, wherein the  
2 method further comprises, if the query includes a select statement, inserting a case  
3 statement into the select statement that calls a function that causes the audit record  
4 to be created and recorded if the auditing condition is satisfied.

1           11. The computer-readable storage medium of claim 10, wherein the  
2 method further comprises ensuring that the case statement is evaluated near the  
3 end of the query processing to that the case statement is evaluated only after other  
4 conditions of the query are satisfied, so that the audit record is created only for  
5 rows that are actually accessed by the query.

1           12. The computer-readable storage medium of claim 9, wherein the  
2 method further comprises retrieving the auditing condition for a given table from  
3 a data structure associated with the given table.

1           13. The computer-readable storage medium of claim 9, wherein if the  
2 query modifies at least one entry in the relational database, the method further  
3 comprises using a relational database system trigger to create and record the audit  
4 record for the modification to the relational database.

1           14. The computer-readable storage medium of claim 10, wherein  
2 inserting the case statement into the query further comprises:  
3           inserting the case statement into the query;  
4           allowing a query processor to allocate buffers for the query;  
5           removing the case statement from the query;  
6           allowing the query processor to generate a query plan for the query; and  
7           scheduling the case statement near the end of the query plan to ensure that  
8 the case statement is evaluated only after other conditions of the query are  
9 satisfied, so that the audit record is created only for rows that are actually accessed  
10 by the query.

1           15. The computer-readable storage medium of claim 9, wherein the  
2 audit record includes:  
3           a user name for a user making the query;  
4           a time stamp specifying a time of the query; and  
5           a text of the query.

1       16. The computer-readable storage medium of claim 9, wherein the  
2 auditing condition includes a condition for a field within the relational database.

1       17. An apparatus that selectively audits accesses to a relational  
2 database, comprising:

3            a receiving mechanism that is configured to receive a query for the  
4 relational database;  
5            a query modification mechanism that is configured to modify the query so  
6 that processing the query causes an audit record to be created and recorded for  
7 rows in relational tables that are accessed by the query and that satisfy an auditing  
8 condition;

9            a query processor that is configured to process the modified query to  
10 produce a query result, wherein processing the modified query includes,  
11                  creating the audit record for rows in relational tables that  
12 are accessed by the query and that satisfy the auditing condition,  
13                  and  
14                  recording the audit record in an audit record store; and  
15                  a returning mechanism that is configured to return the query result.

1       18. The apparatus of claim 17, wherein if the query includes a select  
2 statement, the query modification mechanism is configured to insert a case  
3 statement into the select statement that calls a function that causes the audit record  
4 to be created and recorded if the auditing condition is satisfied.

1       19. The apparatus of claim 18, wherein the query modification  
2 mechanism is configured to ensure that the case statement is evaluated near the  
3 end of the query processing so that the case statement is evaluated only after other

4 conditions of the query are satisfied, so that the audit record is created only for  
5 rows that are actually accessed by the query.

1           20. The apparatus of claim 17, wherein the query modification  
2 mechanism is configured to retrieve the auditing condition for a given table from a  
3 data structure associated with the given table.

1           21. The apparatus of claim 17, wherein if the query modifies at least  
2 one entry in the relational database, the apparatus uses a relational database  
3 system trigger to create and record the audit record for the modification to the  
4 relational database.

1           22. The apparatus of claim 18, wherein the query modification  
2 mechanism is configured to:  
3           insert the case statement into the query;  
4           allow the query processor to allocate buffers for the query;  
5           remove the case statement from the query;  
6           allow the query processor to generate a query plan for the query; and  
7           schedule the case statement near the end of the query plan to ensure that  
8           the case statement is evaluated only after other conditions of the query are  
9           satisfied, so that the audit record is created only for rows that are actually accessed  
10          by the query.

1           23. The apparatus of claim 17, wherein the audit record includes:  
2           a user name for a user making the query;  
3           a time stamp specifying a time of the query; and  
4           a text of the query.

- 1           24. The apparatus of claim 17, wherein the auditing condition includes  
2       a condition for a field within the relational database.